

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: Houston

Docket No.: TI-32205.1

Serial No.: 10/664,547

Art Unit: 2822

Filed: 09/19/2003

Examiner: Lewis, Monica

Title: Integrated DRAM Process/Structure Using Contact Pillars

**PETITION UNDER 37 CFR §1.181(A)
Request for Withdrawal of the Holding of Abandonment
Based on Failure to Receive Office Action**

October 26, 2006

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

In response to the Notice of Abandonment dated 10/06/2006 in the above-identified patent application, the Applicant submits the following evidence in support of the nonreceipt of an Office action in accordance with M.P.E.P. §711.03(c). This Petition is respectfully submitted with the Amendment as a full and complete response to the Notice of Abandonment. No fee is believed to be due; however, the USPTO is herein authorized to charge any required fees to the deposit account of Texas Instruments Incorporated, Account No. 20-0668.

REMARKS

The Applicant's Practitioner submits the following facts in support of this Petition:

1. The Image File Wrapper, which is accessible on Private PAIR, states that the Final Rejection was mailed on 03/27/2006 (copy attached). The Image File Wrapper for the 03/27/2006 document shows that the Correspondence Address on the front page of the final Office action was correct.
2. The Image File Wrapper, which is accessible on Private PAIR, states "Mail returned to the USPTO as undelivered" on 04/03/2006 (copy attached).
3. The Image File Wrapper, which is accessible on Private PAIR, states that the Final Rejection was not re-sent to the Correspondence Address after being returned to the USPTO (copy attached).
4. The last page (page 8) of the 04/03/2006 document in the Image File Wrapper shows a USPTO "RECEIVED" stamp on the outside of the envelope (copy attached).
5. The Applicant's practitioner does not remember a call from the Examiner informing the practitioner that this case is scheduled for Abandonment and inquiring whether a response to the 03/27/2006 Office Action was sent to the USPTO.

6. Private PAIR and the Applicant's practitioner do not have any documentation that the practitioner was contacted by the Examiner subsequent to the mailing of the Final Rejection on 03/27/1006.
7. The Office communication was not received by the Applicant's practitioner or the Assignee, as evidenced by the IP Master docket record where the nonreceived Office Communication would have been entered had it been received and docketed (copy attached).

For the reasons stated above the Applicant petitions the Director to withdraw the Examiner's holding of abandonment. Should the Director have any questions regarding this Petition, the Director is respectfully requested to contact the undersigned practitioner in order to expeditiously resolve any outstanding issues

Respectfully submitted,

/Rose Alyssa Keagy/

Rose Alyssa Keagy
Attorney for Applicant
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Texas Instruments Incorporated
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972/917-4167
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Patent: T32205, United States, Regular, National, Division

Patent Data

Docket Number	T32205	Attorney	Keagy, Rose A.
Country	United States	Agent	
Case Type	Regular	Client/Division	CORP CRD&E SPDC
Relation Type	Division	Current Owner	Texas Instruments
Filing Type	National	Previous Owner	
Filing Number		Con/Div	.1
Status	Filed	First Filing Date	6/26/2002
Sub Status		Sub Status Date	
Parent Country		Parent Filing Date	6/26/2002
Parent Number		Parent Grant Date	
Application Number	10/664,547	Application Date	9/19/2003
Patent Number		Grant Date	
Publication Number	2004-0061164	Publication Date	4/1/2004
Assigned	Assignment Recorded	Ind. Claims/Designs	
Convention Type		Total Claims	
Custom Code #1		TotalClasses	
TaxAgent		ConfirmationNumber	4290
Operating Group		Tax Base Date	
Custom Party #1		Next Tax Date	
Custom Party #2		Expiration Date	
Custom Party #3		PTO Customer No.	23494
Custom Party #4		Custom Date #1	
Custom Party #5		Storage Location	RAK
Custom Party #6		Conception Date	
Custom Party #7		Storage Box/Date	10/9/2006
Custom Party #8		Receive Date	
Agent Ref No		Art Unit	2822
Strategy 1	Process	Last Review Date	
Strategy 2		Examiner Name	
Strategy 3		Gov Contract No	
Licensing		Disc/3rd Yr Merit	
Custom Code #6		7th Yr Merit	
Custom Code #7		11th Yr Merit	
Customer Code		Customer Name	Texas Instruments

Title

INTEGRATED DRAM PROCESS/STRUCTURE USING CONTACT PILLARS

Description

INTEGRATED DRAM PROCESS/STRUCTURE USING CONTACT PILLARS A capacitor under bitline DRAM memory cell and method for its fabrication provides a high density memory cell with the capacitor formed in the PMD layer. The memory cell utilizes several variations of storage contact pillar structures as, for example, a storage plate of the memory cell capacitor formed within a trench in the PMD layer. This capacitor plate structure is overlaid with a capacitor dielectric layer which is overlaid with another conductive layer, for example, the M1 layer to form the other capacitor plate. An access transistor formed between substrate active regions and a word line, is in electrical communication with a bit line contact, the storage contact capacitor plate, and the word line respectively. The high density memory cell benefits from the simple standard processes common to logic processes, and in one embodiment requiring only one additional masking step. Main claim: 1. An embedded DRAM memory cell, comprising: an access transistor, the access transistor comprising: a source and a drain within a substrate, and having a channel region therebetween; and a gate dielectric and a gate electrode overlying the channel region, the gate electrode forming a portion of a word line associated with the DRAM memory cell; the access transistor covered by a first insulating layer; a bit line contact pillar extending through the first insulating layer and contacting the drain of the access transistor, the bit line contact pillar composed of a contact conductive material; a three dimensional capacitor structure comprising: a storage plate comprising a storage contact pillar residing within a trench formed in the first insulating layer, and coupled to the source of the access transistor, and laterally

spaced away from a side wall of the trench; and a capacitor dielectric layer overlaying the trench and the storage contact pillar within the trench; and a ground plate overlying the capacitor dielectric layer; a second insulating layer overlying the access transistor, and having a first opening overlying the bit line contact pillar and a second opening overlying the trench; and a conductive material within the first and second openings, respectively, wherein the conductive material within the first opening comprises a bit line contact and the conductive material within the second opening comprises the ground plate of the three dimensional capacitor structure.

Current Expense Information

Other Case-Related Information

Actions

Action	Atty Action Due Date	Atty Action Comp Date	Response Due Date	Mail Date	PTO Complete Date	Assigned Atty	Review Atty	Action Notes
Divisional Application Declaration				9/19/2003	9/19/2003	Keagy, Rose A.		
Preliminary Amendment				9/19/2003	9/19/2003	Keagy, Rose A.		
Info Discl. Statement				9/19/2003	9/19/2003	Keagy, Rose A.		
Express mail Receipt		9/19/2003						
Drawings filed				12/8/2003	12/12/2003	Keagy, Rose A.		
Blue Filing Receipt					12/12/2003			
Application Rejected					2/25/2005			
Application Rejected					10/20/2005			
Notice of abandonment					10/6/2006			According to IPMaster we did not receive the final rejection mailed on 3/27/06 unless it somehow got missed and therefor was never entered.
Rejection response due - 2nd			5/25/2005	7/25/2005	7/25/2005	Keagy, Rose A.		
Rejection response due			1/20/2006	1/9/2006	1/9/2006	Keagy, Rose A.		
Abandon?			12/6/2006					

Inventors

Inventor	Division	Cost Center	Employee No	Original Inventor Name	Company Status	Assignment Date	Term Date
3	579	0093581		HOUSTON, THEODORE W			

CreateUser: usecs\ca0213827

UpdateUser: ENT\ca0175044

CreateDate: 9/22/2003

UpdateDate: 10/26/2006

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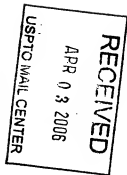
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,547	09/19/2003	Theodore W. Houston	TI-32205.1	4290

23494 7590 03/27/2006

TEXAS INSTRUMENTS INCORPORATED
P O BOX 655474, M/S 3999
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EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/664,547

Applicant(s)

HOUSTON, THEODORE W.

Examiner

Monica Lewis

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 49-53 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 49-53 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 21 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the amendment filed January 9, 2006.

Response to Arguments

2. Applicant's arguments with respect to claims 49-53 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 49-52 are rejected under 35 U.S.C. 102(b) as being anticipated by Turner (U.S. Patent No. 5,357,132).

In regards to claim 49, Houston et al. ("Houston") discloses the following:

- a) a dielectric layer (48) disposed between a substrate and a first metal layer (68) (For Example: See Figure 9);
- b) a trench defined by a recess in the dielectric layer (For Example: See Figure 9);
- c) a first contact pillar (64) extending substantially from a top surface of the substrate to a bottom surface of the first metal layer (68) within the trench (For Example: See Figure 9); and
- d) a capacitor formed in the trench overlying the first contact pillar such that the capacitor is formed at least in part on a side of the first contact pillar, and the first contact pillar is a plate of the capacitor (For Example: See Column 6 Lines 46-50).

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In regards to claim 50, Houston discloses the following:

a) a second contact pillar (62) extending substantially from a top surface of the substrate to a bottom surface of another portion of the first metal layer wherein the second contact pillar is substantially the same height as the first contact pillar (For Example: See Figure 9).

In regards to claim 51, Houston discloses the following:

a) the capacitor comprises a storage element of a memory cell (For Example: See Column 1 Lines 15-25).

In regards to claim 52, Houston discloses the following:

a) a storage node of the storage element comprises a first contact pillar (For Example: See Abstract).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 53 is rejected under 35 U.S.C. 103(a) as obvious over Turner (U.S. Patent No. 5,357,132) in view of Chen et al. (U.S. Patent No. 6,093,600) and Fisher et al. (U.S. Patent No. 5,962,885).

In regards to claim 53, Houston fails to disclose the following:

a) a storage node further comprises a conducting layer lining the trench and the side of the first contact pillar.

However, Fisher et al. ("Fisher") discloses the use of a storage node further that comprises a conducting layer (80) lining the trench and the side of the first contact pillar (70) (For Example: See Figure 6). It would have been obvious to one having ordinary skill in the art

at the time the invention was made to modify the semiconductor device of Houston to include storage node that comprises a conducting layer lining the trench and the side of the first contact pillar as disclosed in Fisher because it aids in increasing capacitance (For Example: See Column 1 Lines 51 and 52).

Additionally, since Houston and Fisher are both from the same field of endeavor (semiconductors), the purpose disclosed by Fisher would have been recognized in the pertinent art of Houston.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 571-272-1838. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300 for regular and after final communications.

ML
March 16, 2006



Mary Wilczewski
Primary Examiner

Notice of References Cited	Application/Control No. 10/664,547		Applicant(s)/Patent Under Reexamination HOUSTON, THEODORE W.	
	Examiner Monica Lewis		Art Unit 2822	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-5,962,885	10-1999	Fischer et al.	257/306
*	B	US-5,357,132	10-1994	Turner, Timothy E.	257/305
*	C	US-6,093,600	07-2000	Chen et al.	438/243
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.



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